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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,469	03/25/2004	Tomohisa Hamano	Q80134	6291
23373	7590	05/11/2005	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			AMARI, ALESSANDRÒ V	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 05/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

<b>Office Action Summary</b>	Application No. 10/808,469	Applicant(s) HAMANO ET AL.	
	Examiner Alessandro V. Amari	Art Unit 2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 February 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 24-28, 40-45, 52 and 53 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 24, 25, 27, 41, 52 and 53 is/are rejected.
- 7) ☒ Claim(s) 26, 28, 40 and 42-45 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 28, 44 and 45 are objected to because of the following informalities:

Regarding claim 28, line 2, the phrase, "the number of steps" has no prior mention in claim 24 on which claim 28 is dependent.

Regarding claim 44, the phrase, "the number of steps" has no prior mention in claims 24 and 26 on which claim 44 is dependent.

Regarding claim 45, line 2, the phrase, "the number of steps" has no prior mention in claims 24 or 27 on which claim 45 is dependent.

It appears that the above claims should have been dependent from the other independent claim 25 and so have not been treated further on the merits.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 24, 25, 52 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekine US 6,417,940 in view of Taniguchi et al US 5,543,228.

In regard to claims 24 and 25, Sekine discloses (see Figure 1) a process for fabricating a computer-generated hologram (2) by defining a range which diffraction light obtained by diffraction of incident light leaves as described in column 2, lines 55-

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67, determining a hologram phase distribution for allowing said diffraction light to leave the defined range as described in column 3, lines 11-30, quantizing a determined phase distribution to find a quantized depth of a hologram relief and the number of steps of said depth and photoetching a substrate on the basis of found quantized depth or repeating photoetching given times corresponding to an obtained depth and the number of steps as described in column 3, lines 37-67 and column 4, lines 42-65.

However, regarding claims 24 and 25, Sekine does not teach forming a relief on a substrate by photoetching on the basis of a found quantized depth or repeating photoetching given times corresponding to an obtained depth and the number of steps to obtain a relief pattern and patterning a resin layer using said relief pattern to form a hologram relief on a surface of said resin layer. Further, regarding claims 52 and 53, Sekine does not teach wherein the step of patterning a resin layer using said relief pattern to form a hologram relief on the surface of said resin layer includes pressing the relief pattern against the resin layer and then curing the resin layer.

In regard to claims 24 and 25, Taniguchi et al teaches (see Figures 2(a)-2(f), 11(a)-11(c)) forming a relief on a substrate (1, 81) by photoetching on the basis of a found quantized depth to obtain a relief pattern (87), and patterning a resin layer (2, 89) using said relief pattern to form a hologram relief on a surface of said resin layer as described in column 3, lines 3-14 and column 8, lines 12-55.

Regarding claims 52 and 53, Taniguchi et al teaches (see Figures 11(a)-11(d)) the step of patterning a resin layer using said relief pattern to form a hologram relief on the surface of said resin layer includes pressing the relief pattern against the resin layer

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and then curing the resin layer as shown in Figure 11(c) and as described in column 8, lines 12-55.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the process of forming a relief on a substrate and patterning, pressing and curing a resin layer as taught by Taniguchi et al with the process of determining a hologram phase distribution and quantizing a determined distribution as taught by Sekine in order that neither peeling nor change of optical properties will occur in order to form a more stable hologram and to lengthen the life of the hologram.

4. Claims 27 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sekine US 6,417,940 in view of Taniguchi et al US 5,543,228 and further in view of Veldkamp et al US 4,846,552.

Regarding claims 27 and 41, Sekine in view of Taniguchi et al teaches the invention as set forth above but regarding claims 27 and 41, does not teach an optical reflective layer laminated on and along a relief side or other side of said resin layer.

Regarding claims 27 and 41, Veldkamp et al teaches (see Figure 1) an optical reflective layer (102) laminated on and along a relief side or other side of said resin layer.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the optical reflective layer as taught by Veldkamp et al in the hologram of Sekine in view of Taniguchi et al in order to achieve a higher quality and a higher diffractive efficiency hologram.

***Allowable Subject Matter***

5. Claim 26, 40, 42 and 43 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. Claims 26 and 40 are allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "relief is formed on the basis of a phase distribution obtained by repeatedly arranging a phase distribution of said elemental hologram piece across said substrate" as set forth in the claimed combination. Claim 42 is also allowable based upon its dependence on claim 24.

Claim 43 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "the number of steps L having a depth of said relief is the N-th power of 2 where N is the number of photoetching cycles" as set forth in the claimed combination.

The prior art of record teaches a process for fabricating a computer-generated hologram by defining a range, determining the hologram phase distribution, quantizing a determined phase distribution to find a quantized depth of a hologram forming a relief on a substrate by photoetching or repeating photoetching given times corresponding to an obtained depth and the number of steps to form a relief pattern, patterning a resin layer using the relief pattern to form a hologram relief on a surface of the resin layer. However, the prior art of record does not teach that the relief is formed on the basis of a phase distribution obtained by repeatedly arranging a phase distribution of said elemental hologram piece across said substrate or that the number of steps L having a

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depth of said relief is the N-th power of 2 where N is the number of photoetching cycles and there is no motivation or teaching to modify this difference as derived.

***Response to Arguments***

7. Applicant's arguments with respect to claims 24, 26-28, 42, 44, 45 and 52 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Slinger US 6,043,910 teaches a process for fabricating a computer-generated hologram.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (571) 272-2306. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ava  
03 May 2005

Alessandro Amari  
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Examiner AU 2872